REMARKS

In sections 2 and 3 of the Office Action, the Examiner objected to the amendments to claims 22, 23, 30, 34, and 40 under 35 U.S.C. §132(a) as introducing new matter into the application and has required applicants to delete the new matter. Specifically, the Examiner objects to the limitation "transforming the data in the first and second tables to corresponding first and second discrepancies" that was added to claims 22 and 23 in the March 9, 2007 amendment, and to the limitation "computer transforming at least some of the data in the first and second tables to corresponding first and second discrepancies" added to claims 30, 34, and 40 also in the March 9, 2007 amendment.

However, one skilled in the art will recognize that these limitations were fully disclosed in the original application. For example, the original application at page 18, line 13 to page 20, line 15 discloses that the spaces required for relief of crowding between the right canine and the midline and between the left canine and the midline (3x3) are recorded in both the 3x3 table and the 7x7 table of Figure 9, that the spaces required for the relief of crowding of the right

premolars (bicuspids) and the left premolars are recorded only in the 7x7 table, that the spaces required for the relief of crowding of the right molars and the left molars are also recorded only in the 7x7 table, that the space required to level the curve of Spee is recorded in both tables, and that the space required to correct protrusion or intrusion of the lower incisors is recorded in both tables. This portion of the application goes on to disclose that these spaces are summed and the sum is entered as in both tables as initial discrepancies.

Accordingly, one skilled in the art will easily understand that the summing of this spacing data is one form of a transformation of this spacing data into initial discrepancy data that is then also recorded in the tables.

This portion of the application goes on to disclose that stripping, expansion, distalizing, and extraction spaces are also recoded in the tables and that these spaces are summed with the initial discrepancy data to produce final discrepancies.

Accordingly, one skilled in the art will also easily understand that the summing of the initial discrepancy with the additional spacing data is one form

of a transformation of this data from individual spacing data into final discrepancy data that is further recorded in the tables.

(Summing of spacing data is, of course, but one example of data transformation.)

Accordingly, because the present application originally transforming (e.g., summing) crowding/spacing data into discrepancy data, no new matter has been introduced into the application by the amendments of March 9, 2007.

In sections 4-7 of the Office Action, the Examiner rejected claims 22, 23, 30, 34, and 40 under 35 U.S.C. §112, first paragraph, as containing subject that was not described in the application as originally filed. Specifically, the Examiner asserts that the limitation "transforming the data in the first and second tables to corresponding first and second discrepancies" of claims 22 and 23 and that the limitation "computer transforming at least some of the data in the first and second tables to corresponding first and second discrepancies" of claims 30, 34, and 40 were not disclosed in the application as originally filed.

However, as pointed out above, the transformation (e.g., summing) of crowding/spacing data into discrepancy data was described and disclosed in the application as originally filed. Although the application as originally filed did not explicitly use the word "transformation," one skilled in the art would have little doubt that what was described and disclosed in the application as originally filed was a transformation of crowding/spacing data to discrepancy data.

Accordingly, claims 22, 23, 30, 34, and 40 meet the requirements of 35 U.S.C. §112, first paragraph.

In sections 8 and 9 of the Office Action, the Examiner rejected claims 22-44 under 35 U.S.C. §112, second paragraph, as being indefinite.

With respect to claims 22, 30, 34, and 40, the Examiner asserts that the limitation "transforming the data in the first and second tables to corresponding first and second discrepancies" of claim 22 and the limitation "computer transforming at least some of the data in the first and second tables to corresponding first and second discrepancies" of claims 30, 34, and 40 are not described in the specification.

However, as indicated above, one skilled in the art will recognize that these limitations are fully disclosed in the application as originally filed.

Accordingly, claims 22, 30, 34, and 40 fully comply with 35 U.S.C. §112, second paragraph.

With respect to claim 30, the Examiner asserts that the limitation "planning an orthodontic treatment based upon the crowding/spacing data entered into the first and second tables and the first and second discrepancies" of claim 30 is not clear. As applicant understands this objection, the Examiner apparently wants applicant to narrow the claim by adding further planning limitations to the claim.

However, such an objection is not really one of clarity or definiteness because one skilled in the art will easily understand how an orthodontic treatment can be planned based upon the crowding/spacing data and the first and second discrepancies. What is more, the specification discloses as an example of this planning that the crowding/spacing data and the first and second discrepancies can be used in combination with the chart of Figure 10 to record anticipated treatment changes for a patient, i.e., an orthodontic treatment is planned by

anticipating treatment changes required to effect the orthodontic treatment plan.

Accordingly, claim 30 fully complies with 35 U.S.C. §112, second paragraph.

On pages 15-17 of the Office Action, the Examiner responded to applicant's 112, second paragraph arguments by arguing that the crowding/spacing data recited in claim 30 is unclear because applicant does not recite whether this crowding/spacing data is distance data or coordinate data.

Does it really matter whether this crowding/spacing data is distance data or coordinate data? The present application discloses that the crowding/spacing data is essentially spacing data because it is necessary to determine whether the patient's teeth are crowded requiring the creation of additional spacing along the arch to accommodate movement of the patient's teeth during treatment or whether there is sufficient existing spacing along the arch to accommodate movement of the patient's teeth during treatment. As one skilled in the art easily recognizes, spacing can be measured in either distances or coordinates, although distances might be the more normal way of determining crowding/spacing

data. (Indeed, the present application specifically teaches distances, but coordinates could also be used.)

Moreover, those skilled in the art routinely work with crowding/spacing data and will understand how this data should be measured.

The Examiner also asserts that the planning limitation of claim 30 is not clear. Again, as pointed out above, the Examiner apparently wants applicant to narrow the claim by adding further planning limitations to the claim.

However, such an objection is not really one of clarity or definiteness because one skilled in the art will easily understand how an orthodontic treatment can be planned based upon the crowding/spacing data and the first and second discrepancies. The specification of the present application discloses as an example of this planning that the crowding/spacing data and the first and second discrepancies can be used in combination with the chart of Figure 10 to record anticipated treatment changes for a patient, i.e., an orthodontic treatment is planned by anticipating treatment changes required to effect the orthodontic treatment plan.

Accordingly, claim 30 is not indefinite and fully complies with the requirements of 35 U.S.C. §112, second paragraph.

In sections 10 and 11 of the Office Action, the Examiner rejected claims 1-44 under 35 U.S.C. §101 because, according to the Examiner, the inventions of these claims do not produce tangible and useful results. The Examiner further asserts that the first and second totals of claim 1, that the first, second, and third totals of claim 14, and that the transformed data of claims 22 and 30 are not tangible or useful.

These assertions are directly contrary to State Street Bank & Trust Co. v. Signature Financial Group Inc., 149 F. 3d 1368, 47 USPQ2d 1596 (Fed. Cir. 1998). In that case, the court found that the transformation of input numbers (in the form of discrete dollar amounts) into an output number (a final share price) produces a tangible and useful result in the form of the output number (the final share price) that may be at least momentarily stored, that may be fixed for recording and reporting purposes, and that is accepted and relied upon by regulatory authorities and in subsequent trades.

The claims in the present application are direct analogs to the claims under consideration in the State Street Bank case.

For example, independent claim 1 is directed to the transformation of discrete crowding/spacing and other data related to a patient's teeth in different regions of the patient's jaw into final discrepancies that may be at least momentarily stored, recorded, and reported and that are accepted and relied upon by orthodontists in the practice of their trades. Hence, as in State Street Bank, the invention of independent claim 1 produces a useful and tangible result.

As can be seen, independent claim 1 exactly fits the holding of State Street Bank and, as a result, is directed to statutory subject matter.

Independent claim 14 is similarly directed to the transformation of discrete crowding/spacing and additional data related to a patient's teeth in different regions of the patient's jaw into initial discrepancies and the further transformation of the initial discrepancies and certain other data into final discrepancies that may be stored, recorded, and reported and that are accepted and relied upon by orthodontists in

the practice of their trades. Hence, as in State Street Bank, the invention of independent claim 14 produces a useful and tangible result.

As can be seen, independent claim 14 exactly fits the holding of State Street Bank and, as a result, is directed to statutory subject matter.

Independent claim 22 is similarly directed to the transformation of discrete crowding/spacing related to a patient's teeth in different regions of the patient's jaw into discrepancies that may be stored, recorded, and reported and that are accepted and relied upon by orthodontists in the practice of their trades. Hence, as in State Street Bank, the invention of independent claim 22 produces a useful and tangible result.

As can be seen, independent claim 22 exactly fits the holding of State Street Bank and, as a result, is directed to statutory subject matter.

Independent claim 30 is similarly directed to the transformation of discrete crowding/spacing data related to a patient's teeth in different regions of the patient's jaw into discrepancies that may be stored, recorded, and reported and that are accepted and relied

upon by orthodontists in the practice of their trades. Hence, as in State Street Bank, the invention of independent claim 30 produces a useful and tangible result.

As can be seen, independent claim 30 exactly fits the holding of State Street Bank and, as a result, is directed to statutory subject matter.

On pages 17-20 of the Office Action, the Examiner responded to applicant's 101 arguments by noting the four step process of determining whether a claim is directed to statutory subject matter.

With regard to the first step, the Examiner does not dispute that the claims fall within one of the four categories enumerated in §101.

With regard to the second step, the Examiner asserts that the claims are directed to an abstract idea and, therefore, are not directed to statutory subject matter. However, it cannot be disputed that the claims of the present application are direct analogs of the claims allowed by the court of Appeals for the Federal Circuit in State Street Bank. Therefore, the claims of the present application are not directed to an abstract idea.

With regard to the third step, the Examiner asserts that the claims are not directed to a useful result. However, it again cannot be disputed that the claims of the present application are direct analogs of the claims allowed by the court of Appeals for the Federal Circuit in State Street Bank. Therefore, the claims of the present application are not directed to an abstract idea.

In this regard, the Examiner acknowledges that, according to State Street Bank, a claimed invention is not non-statutory merely because it is directed to inputting numbers, calculating numbers, outputting numbers, and storing numbers. However, the Examiner goes on to assert that the claimed invention does not teach outputting or storing numbers.

This assertion can be taken two ways. The Examiner may be asserting that the claims of the present application do not recite outputting or storing numbers. However, the claims involved in State Street Bank also did not recite outputting and storing.

Alternatively, the Examiner may be asserting that the outputting or storing numbers must be disclosed in the application. However, the present application

discloses a computer program 100, which is shown in Figures 14A-14C by way of a flow chart and which is executed by a computer. The program as executed by a computer prompts a user to enter data, inserts (stores) the data in charts, and displays (outputs) the completed charts.

Either way, the present claims are direct analogs of the claims in State Street Bank. Therefore, the claims are directed to statutory subject matter.

With regard to the fourth step, the Examiner appears to assert that the present claims attempt to wholly preempt a judicial exemption (an abstract idea). However, as stated above, it cannot be disputed that the claims of the present application are direct analogs of the claims allowed by the court of Appeals for the Federal Circuit in State Street Bank. Therefore, the claims of the present application do not seek to wholly preempt an abstract idea.

For the reasons given above, it can be seen that the claims of the present application are directed to statutory subject matter.

In sections 12-13 of the Office Action, the Examiner rejected claims 1-44 under 35 U.S.C. §102(b) as being anticipated by Andreiko.

Andreiko discloses a system and method for automatically designing custom orthodontic appliances. Final positions of a patient's teeth are derived from digitized information of the anatomical shape of the patient's mouth, and an orthodontic appliance is automatically designed from the digitized shape information and the derived tooth final positions. The appliance is automatically fabricated from the design.

According to Andreiko, the digitized information is generated from measurements of the mouth of the patient, either taken directly or from a model of the patient's mouth, and includes information of the shapes of the individual teeth of the patient and of the patient's lower jaw. The final tooth positions include the derivation of an archform conforming to a skeletal archform defined by the shape of the lower jaw. The appliance is configured in accordance with the shape of this archform. Additional archforms may be constructed using information about the shapes of the individual teeth and the lower jaw skeletal archform to define the

positions of the buccal cusps and incisal tips of the mandibular teeth, the marginal ridges of the upper posterior teeth, and the lingual points of occlusion of the upper anterior teeth to position the teeth according to a preferred treatment plan.

An archwire forming machine is provided to automatically form an arcuate appliance that interconnects the teeth to move them toward their final positions. The archwire forming machine reads input data of the anatomical shape of the patient's jaw and teeth, derives the tooth final positions and the archwire and bracket designs that will move the teeth to the calculated final positions, and generates code to produce the archwire in accordance with the design. A bracket fabrication machine fabricates the brackets based on the final tooth position calculations and the digitized tooth shape data, and determines positions on the teeth to receive archwires that are inclined at computer determined angles.

Independent claim 1 - As can be seen, Andreiko does not disclose a method involving entering cuspid to midline crowding/spacing data, curve of Spee spacing data, midline spacing data, and incisor position data in

first and second tables, and entering bicuspid and molar crowding/spacing data in the second table but not the first table, where the first table relates to the cuspid to midline regions of a patient's jaw, and where the second table relates to the second molar to midline regions of the patient's jaw.

The Examiner, in previously pointing to certain passages of Andreiko, asserts that Andreiko discloses entering the data into a first table that relates to cuspid to midline regions of a patient's jaw and into a second table that relates to second molar to midline regions of the patient's jaw. These passages will be discussed below in the order that they are cited by the Examiner, and it will be shown that none of these passages discloses or suggests entering data in the tables recited in independent claim 1.

Column 12, lines 18-32 state that the various teeth of the patient are identified as T_{JSI}, or T(J,S,I), where J designates the jaw (upper or lower), where S designates the side of the jaw,, and where I designates the tooth by position relative to the jaw centerline.

As can be seen, there is no mention here of the tables recited in independent claim 1.

Column 13, lines 53-68 state that the entry of information into an input computer involves digitizing information to produce digitized anatomical information in machine readable form for analysis by an analyzing computer, that the input computer is connected to a scanner that produces anatomical geometric information describing the patient's teeth and jaw, and that the images [from the scanner] are three-dimensional, or are along a plurality of planes or other surfaces that can ultimately be combined to provide information in three dimensions.

As can be seen, there is no mention here of entering data in the tables recited in independent claim 1.

Column 37, lines 5-18 state that, in order to input data of a patient's mandibular teeth and lower jaw, an image of a mandibular model is first input to a screen of the computer, that a grid G is overlaid on the image as illustrated in Figure 4, that the grid G has grid lines that intersect the image on the screen, and that the operator resizes the grid G, if necessary, and orients the image relative to the grid G in order to define X,Y coordinates with a Y axis on a midline of the

patient's lower jaw and an X axis perpendicular to the Y axis through a selected intersection point or origin 0,0, preferably set at the mesial contact points of the patient's lower central incisors.

As can be seen, neither the image nor the grid form the tables that are recited in independent claim 1. Hence, there is no mention in this portion of Andreiko of entering data into the tables recited in independent claim 1.

Column 17, lines 40-59 state that Figures 3A and 3B illustrate images of two sections of a mandibular digitized model, that such images are rotated to a horizontal plan view, that a derivation of the same information that is available from an imager may be derived, that points may be selected automatically or by an operator from the images for digitization, and that the images may be rotated into other orientations for the derivation of other information.

As can be seen, there is no mention in this portion of Andreiko of entering data into the tables recited in independent claim 1.

Column 15, line 53 to column 16, line 4 state that input information includes a full three dimensional

image that is simplified by reducing it to curves in differently oriented planes or flat curved surfaces each of which is defined in the independent X-Y coordinate system, that these planes are oriented, translated and rescaled to derive ideal finish positions of a patient's teeth and a design of a custom appliance, and that curves and points on the contours of the patient's jaw and teeth are expressed in terms of orthodontic parameters so that orthodontic knowledge and experience and computer analysis can be combined to minimize the use of the orthodontist's time, to shorten the patient's treatment period, and to optimize the final treatment result.

As can be seen, there is no mention in this portion of Andreiko of entering data into the tables recited in independent claim 1.

Column 37, lines 19-35 state that a computer prompts an operator to select tooth contact points and jaw bone boundaries to digitize the X,Y coordinates of the mesial and distal extremities for each mandibular tooth, that the mesial extremity is the point on a tooth closest to the midline along the mandibular arch, that the distal extremity is the point on a tooth closest to the rear of the mouth along the mandibular arch, and that

the mesio-distal width of each tooth I is calculated from the X,Y coordinates using the Pythagorean theorem.

As can be seen, there is no mention in this portion of Andreiko of entering data into the tables recited in independent claim 1.

Column 37, lines 36-51 (column 37, lines 19-35 have been discussed above) state that the mesio-distal widths as calculated using the Pythagorean theorem are summed to calculate the total length required of the arch to accommodate the mandibular teeth, and that, since all teeth will be finally positioned to be in contact with adjacent teeth, this length remains a constant length of any arch on which the mandibular teeth are placed in the calculations.

As can be seen, there is no mention in this portion of Andreiko of entering data into the tables recited in independent claim 1.

Column 39, lines 53-55 state that the input procedure continues, and that coordinates are input for right and left mandibular cuspid cusp tips as illustrated in Figure 4.

As can be seen, there is no mention in this portion of Andreiko of entering data into the tables recited in independent claim 1.

Column 40, lines 2-18 state that coordinates or right and left mesiobuccal cusp tips of the mandibular first molars are calculated, and that the distance between these points is calculated, and that this information is used to determine if and how much the mandibular intermolar distance is to be altered.

As can be seen, there is no mention in this portion of Andreiko of entering data into the tables recited in independent claim 1.

Column 40, line 65 to column 31, line 15 state that coordinates of the central fossae of the maxillary first molars are input, that the distance between the central fossae is calculated, that this information is recalculated after the tooth finish positions are calculated to coincide with the spacing of the mandibular first molars, and that this information is compared with this initial measurement as an indicator of whether the intermolar width will be changed by treatment and of the amount of such change, if any.

As can be seen, there is no mention in this portion of Andreiko of entering data into the tables recited in independent claim 1.

Accordingly, none of the passages from Andreiko cited by the Examiner discloses or suggests entering data into the tables specified by independent claim 1. Andreiko does describe storing data in files. However, a file is not equivalent to a table. Accordingly, Andreiko does not disclose the use of tables. Moreover, there is certainly no disclosure in Andreiko of the specific tables recited in independent claim 1, i.e., a first table containing data relating to cuspid to midline regions of a patient's jaw, and a second table containing data relating to second molar to midline regions of the patient's jaw. Indeed, there is not even a hint of these tables in Andreiko.

Because Andreiko does not disclose or suggest entering data in the first and second tables recited in independent claim 1, independent claim 1 is patentable over Andreiko.

Independent claim 14 similarly recites entering cuspid to midline region crowding/spacing data, curve of Spee spacing data, midline spacing data, incisor position

data, and other created space in first and second tables, and entering cuspid to midline region and molar region crowding/spacing data in the second table, where the first table contains data related only to cuspid to midline regions of a patient's jaw, and where the second table relates to second molar to midline regions of the patient's jaw.

As should be understood from the discussion related to independent claim 1, Andreiko does not disclose or suggest entering data in the first and second tables recited in independent claim 14. Acccrdingly, independent claim 14 is patentable over Andreiko.

Independent claim 22 recites entering midline and molar relationships into a midline chart, entering crowding/spacing data into a discrepancy chart having first and second tables, and entering data from the first and second tables into an anticipated treatment chart. The first table contains data related only to cuspid to midline regions of a patient's jaw, and the second table relates to second molar to midline regions of the patient's jaw and includes the cuspid to midline regions of the patient's jaw.

As should be understood from the above discussion, Andreiko does not disclose or suggest entering data in the first and second tables recited in independent claim 22. Accordingly, independent claim 22 is patentable over Andreiko.

Independent claim 30 recites entering cuspid to midline region crowding/spacing data in a first table, entering second molar to midline region crowding/spacing data in a second table, and planning an orthodontic treatment based upon the crowding/spacing data entered into the first and second tables.

As should be clear from the discussion of Andreiko, Andreiko does not disclose or suggest entering data in the first and second tables recited in independent claim 30. Accordingly, independent claim 30 is patentable over Andreiko.

Because independent claims 1, 14, 22, and 30 are patentable over Andreiko, dependent claims 2-13, 15-21, 23-29, and 31-44 are likewise patentable over Andreiko.

On pages 20 and 21 of the Office Action, the Examiner responded to applicant's 102 arguments by again arguing that the grid lines represent the organization of

data recited in the claims of the present application. However, there is no teaching or suggestion in Andreiko of using these grid lines to organize data as recited in the rejected claims. Indeed, there is simply nothing anywhere in Andreiko that teaches or suggests the organization of data as recited in the rejected claims.

Thus, the claims of the present application are patentable over Andreiko.

CONCLUSION

In view of the above, the claims of the present application are definite, are directed to statutory subject matter, and patentably distinguish over the art applied by the Examiner. Accordingly, allowance of these claims and issuance of the present application are respectfully requested.

The Commissioner is hereby authorized to charge any additional fees that may be required, or to credit any overpayment, to account No. 501519.

Respectfully submitted,

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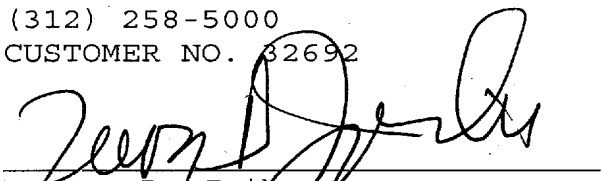
By: 

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